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54. [Title in German of the] Object of the Invention:
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DEVICE FOR THE DEWATERING OF RAW PAPERMAKING MATERIAL

The invention pertains to a device for the dewatering of raw
papermaking material, consisting of a number of suction boxes,
oriented parallelly to one another with their longitudinal sides,
each one of which suction boxes is covered by a flatly designed
and perpendicularly arranged perforated plate, as well as of
sliding blocks, which are adjustable - according to the paper
size (format) - in the longitudinal direction of the suction

boxes, which sliding blocks are interacting with the perforated plate, whereby in the area of the of frontal surfaces of the suction box there is provided a suction socket each, one of which can be closed, and the other one can be connected to the suction pipe, which runs parallelly to one of the frontal surfaces located next to one another.

In the devices for the dewatering of raw papermaking material, above whose perforated plates - which are provided with screen [wire] openings, and are flatly designed and perpendicularly arranged - there passes the wire, the perforated plates are subjected to frictional stress by the wire, in particular, at the longitudinal edges, against which the wire strikes. As a consequence of this, a wear and tear of the perforated plates takes place in the area of the edges, upon which the wire runs, while a bevelling is meanwhile formed, which gradually is displaced more pronouncedly towards the center of the plate. As a result of this, there originates porousness between wire and plate, due to which the negative pressure head [underpressure or (partial) vacuum] decreases. It was proposed that the suction boxes, used in the device are to be provided with a suction socket on each frontal side, respectively. When a suction box of that kind starts to get leaky or porous, it is temporarily removed from the device, rotated thru 180°, and, then, reintegrated into the device with interchanged frontal surfaces. The suction socket, which previously was located away

from the suction pipeline, is now positioned at the suction pipeline, and can be connected to it by means of a short branch junction piece. As soon as the opposite suction socket is connected, the device can resume its operation. By means of the wire, the perforated (screen) plate of the suction box, which has become leaky, becomes automatically adjusted over the course of the operation of the device whereby the term adjusting or fitting [in this particular sense] implies a machining (processing or trueing or surface planing or adjusting by grinding) of the surface of the screen plate by compensating or equalizing the bevelling, originating as a result of the wear on a longitudinal edge. The time-consuming conventional adjustment, which until recently was done manually, is not anymore required.

After the short branch junction piece of the suction pipeline is connected to the suction box, rotated through 180°, the short branch should be secured against being pulled off from the suction socket to which end a separate retainer in the form of a cross-beam [diaphragm beam] is provided in the known suction boxes. A closure or shutter for the suction socket, located oppositely to the suction pipeline, was until recently not cited.

The parts of the suction boxes, made of plastic, which are most endangered, are suction sockets, monolithically connected to the suction box, which suction sockets can easily be damaged in the case of a rugged operation of the device, in particular also when the suction box is hoisted and transported. A suction box, having

damaged suction socket should be replaced with another whereby the consequence is that the replacement of a suction box by another one claims long outage time in the operation of the device. The width of the paper web (mat) cannot be changed in the device, because all screen openings or apertures, located in the screen plates, are always under the negative pressure head [underpressure or partial vacuum], prevailing in the suction box. If narrower paper webs are desirable, one is compelled to cut off lateral stripes from then paper web, made after it has passed through the device. If the process of cutting off, associated with a large input of time and work force, is to be avoided, paper webs, having different width, can be produced only in separate facilities, having relevantly dimensioned suction boxes and wires.

The objective to improve a device - of the kind described above - for the dewatering of raw papermaking material forms the basis of the invention.

In accordance with the invention, it is proposed that in the case of the device, mentioned at the outset, there are provided openings in the bottom area of the two frontal surfaces of the suction box, in the area of which openings easily detachable tube flanges are arranged at the outer sides of the frontal surfaces, which tube flanges possess flanges and pipe sockets, having outer threads, on one of which there can be screwed sealing caps, and on the other one, which is located on the opposite side, there

can be screwed one of the halves of positive clutches

[*Translator's note: Also known as jaw clutches; dog clutches; square-tooth clutches or "claw" clutches], which can be coupled onto the branches of the suction line.

Due to their simple shape, the tube flanges can be manufactured independently from the suction boxes - in accordance with simple working method - of plastic and at a low cost. Likewise, the base box - with the circular openings, provided in the bottom area of both frontal surfaces - can be molded in a cost-effective way of plastic, independently from the screen plate and the sliding blocks, adjustable - according to the paper size (format) - in the longitudinal direction of the suction boxes. Thanks to the tube flanges, having the screw (bolt) thread, arranged on the pipe socket, the replacement of a coupling half for a sealing cap of the device, and a cap for a coupling-half [the half of a positive claw clutch (dog clutch)] can be rapidly undertaken, as a result of which, the outage time of the device over the course of the preparation for automatic adjustment of a screen plate by means of the wire network can be shortened. The positive clutch provides an adequate reliability against a pulling off of the suction pipeline from the tube socket. If a tube socket is damaged, the damage can be eliminated by a mere replacement of the tube flange, as a result of which a lot of time is saved, because the entire suction box does not have to be replaced.

The inventive measures advantageously contribute to the improvement of the economic and technical efficiency of the device.

In order for an optimal negative pressure head [underpressure or partial vacuum] to be adjusted, and for the monitoring of the underpressure in the suction box of the device in accordance with the invention, a negative pressure-head display and - in a way, known in the abstract - a snifter [snifting] valve are arranged on the frontal surfaces of each one of the suction boxes. By monitoring of the underpressure, the instant, which is favorable for the trueing of a screen plate, can be determined.

A preferred exemplified embodiment of the invention is diagrammatically represented in the drawings. Fig. 1 is a side view of the two terminal parts **a** and **b** of a suction box, which is being used in the device in accordance with the invention, whereby pieces are broken away from the lateral wall, in order for parts of a size-adjusting device, spaced in the suction box to be shown, while Fig. 2 is a top view of the part **a** of the suction box, depicted in Fig. 1, while Fig. 3 is a view of the frontal wall of the suction box, in accordance with Fig. 1a and 2, while Fig. 3 of the frontal wall of the box, depicted in Figs. 1a and 2, and Fig. 4 is a top view of the frontal wall of the box, depicted in Fig. 1b.

Each suction box --10-- consists of a base box --11-- , which

on the top of the longitudinal walls --12 and 13-- has fringe flanges --14 and 15-- for the accommodation of the screen plate --16-- , and a circular opening in the bottom area of both frontal walls --17 and 18-- , respectively, of which openings, only the opening -- 19-- in Fig. 3 can be seen. On the frontal surfaces -- 17 , 18-- of each suction box --10-- there is provided a connecting spot for a snifter valve --44-- and a connecting spot for a device --45-- for the measurement of the underpressure. By means of the snifter valve --44-- the required optimal negative pressure head in the suction box --10-- can be adjusted. The device for the measurement of the of the underpressure displays impending porousness in the suction box --10-- , which is contingent upon the wear of the wire [screen] cap --16-- on its striking edges. By reading the underpressure-measuring device, the operator of the device can perceive the most favorable instant, at which the screen plate --16-- of a suction box --10-- should be trued. In order for a degree of freedom to be provided to the bottom, longitudinal stripes --20 and 21-- are integrally molded on the lower surface of the bottom [floor]. In the base box -11-- , there are arranged sliding surface -22 and 23-- , which reach from a longitudinal wall of the suction box --10-- to the other one. The sliding [slide] surface --22, 23-- are preferably supported on the longitudinal walls of the suction box by diagrammatically non-represented angular cantilevers [consoles]. The base boxes --11-- can be made of plastic at a relatively low

cast. By using of the screen plates --16--, tube flanges --24 and 25-- and sliding blocks [devices], which are adjustable - according to the paper size (format)- in the longitudinal direction of the suction boxes, the base box --11-- is transformed into and set up as a suction box --10--.

Each tube flange --24 and 25-- consists of a preferably rectangular flange --28--, on which a tube socket --29 -- is integrally molded. The tube socket --29-- has an outer screw (bolt) thread, upon which one of the two halves of a commercially available positive clutch --30-- or a sealing cap --31-- can optionally be screwed. Screw bolts --32--, arranged in the frontal surfaces, penetrate the flanges --28--, and carry nuts, e.g, non-diagrammatically represented winged or butterfly nuts, - for the purposes of an attachment of the flanges to the frontal surfaces.

The contraptions --26, 27-- for the adjustment of the size (format), respectively width, of the paper web, have movable size (format) slides (sliding blocks) --33--, which stretch from a longitudinal wall --12-- to the other longitudinal wall --13-- of the suction box --13--, and can slide under the screen plate --16-- while in contact with the latter. Each sliding block or format slide is sealed with regard to the sliding surface and the inner surfaces of the lateral walls of the suction box by means of diagrammatically non-represented rubber strips, which are let into the slide. By means of a spindle --34--, whose thread --35-

- engages into a corresponding thread --36-- in the flange --28--, the sliding block - in which the spindle-end, located in the suction box, engages in a free rotational manner - can be adjusted. For the sealing or caulking of the space --37-- behind the sliding block (Fig. 1) against the underpressure prevailing in the suction box, the space --37-- is filled with water. The sealing water is fed from a diagrammatically non-represented water pipeline to the sealing-water connections, arranged in the frontal surfaces.

In accordance with an exemplified embodiment of the invention, the screen plate (perforated plate)--16-- has dovetailed recesses, into which corresponding dovetailed stripes --39 --engage. However, the screen plate can also be screwed together with flanges --14 and 15-- without recesses. Since the screen plate --16-- may also be attached on the suction box --10--, the trueing [adjustment] of the screen plate can be undertaken without a need to remove the screen plate from the suction box. To this end, when the device is temporarily put out of operation, the suction pipeline is removed from the suction box --10--, which is showing signs of leakage, the suction box --10-- is lifted, rotated through 180°, and , then, again lowered into the box -range of the of the device, whereupon the sealing cap --31-- and the positive claw --30-- are screwed off from the pipe sockets --29-- of the tube flanges --24, 25-- , and the two parts - after having been being interchanged on the front - are

again screwed upon the pipe sockets so that screen (perforated) plate --16-- after suction pipeline is connected onto the suction box --10-- is automatically trued by means of the wire during the subsequent operation of the device.

Round openings in the form of wire holes --40-- are provided in their capacity as wire openings in the area of the frontal surfaces. Between these terminal holes or apertures, there are located the wire slots --41--, which can have the mutual positions and shapes, depicted in Fig. 2. However, the wire slots can also be designed as having longer length, and can be arranged in a different manner with respect to one another, as depicted in Fig. 2. It is essential that the small screen openings -- 40-- be located in the range of operation or action of the sliding block [slider]. As a result of this - when the sliding block is adjusted - underneath the holes in small steps, the width of the paper web can also be changed in small steps or increments. Had slots been used instead of the small holes, a change of the paper-web width in small steps or increments would not have been possible. Between the frontal wall and the dotted line --42-- there is shown the slider in unoperated or idle position. The double interval of the dotted lines --42 and 43-- indicates the largest possible width reduction of the paper web.

PATENT CLAIMS

1. Device for the dewatering of raw papermaking material, consisting of a number of suction boxes, which are oriented parallelly to one another with their longitudinal sides, each one of which suction boxes is covered by a flatly designed and perpendicularly arranged perforated plate, as well as of sliding blocks, which are adjustable - according to the paper size (format) - in the longitudinal direction of the suction boxes, which sliding blocks are interacting with the perforated plate, whereby in the area of the frontal surfaces of the suction box there is provided a suction socket, each, one of which can be closed, and the other one can be connected to the suction pipe, which runs parallelly to one of the frontal surfaces located next to one another, characterized in that in the two frontal surfaces (17, 18) of the suction box (10), there are provided openings (19) in the bottom area, in the area of which openings, easily detachable tube flanges (24, 25) are arranged on the outer sides of the frontal surfaces, which tube flanges (24, 25) possess flanges (28) and tube sockets (29), having external thread, upon one of which there can be screwed sealing caps (31), and upon the oppositely situated other one, there can be screwed one of the two halves of the positive claws (30), which can be coupled onto the branches of the suction pipeline.

2. Device as claimed in claim 1, characterized

i n t h a t on the frontal surfaces (17, 18) of each one of the suction boxes (10), there is arranged a display (45) of the underpressure, and - in the abstract - there is also arranged a snifter valve (44).

USDOC/USPTO/STIC/Translations Branch
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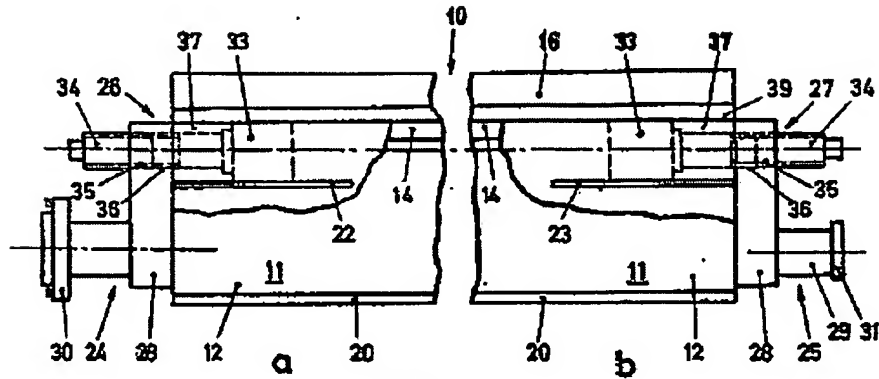


FIG. 1

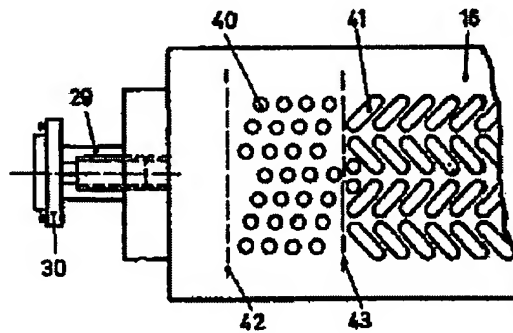


FIG. 2

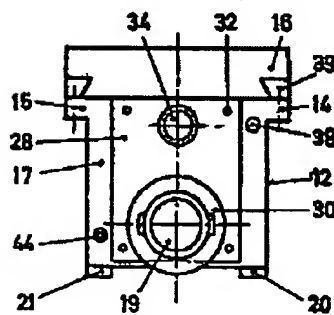


FIG. 3

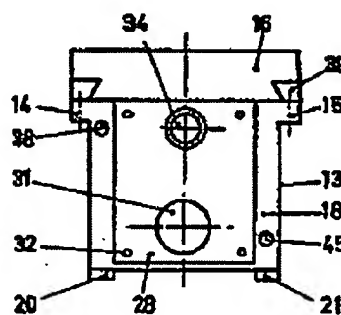


FIG. 4